WHERE THERE'S A WILL, THERE'S A WAY: IDENTIFYING IMPORTANT FACTORS OF PHYSICAL ACTIVITY AMONG OLDER ADULTS.

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Abstract

Older adults in Canada are largely sedentary and do not meet the recommended amount of daily physical activity. It has been suggested that older adults preferences for physical activities move from those characterized by high intensity and competition, to those of lower intensity and higher social components. However, limited research has examined which elements of physical activity influence participation or non-participation in the older adult population. Therefore, the purpose of this research was to determine which of these elements, or "factors", influence older adult's selection of physical activity. A two-phase design was used to collect data. Phase one consisted of a committee of seven older adults who generated a list of 25 factors affecting participation. Phase two consisted of 45 older adults who used the list of factors created by phase one to rank the most important factors across four categories: group structured, group unstructured, individual structured, and individual unstructured activities. The Cochran–Mantel–Haenszel chi–square test was used to investigate the differences between categories on the order of ranks. Results of this analysis show that there is a significant difference in rank orders of factors across the quadrants ($\chi^2 = 75.9$, $p < 0.001$). The second analysis used confidence intervals to investigated differences within categories to determine which factors were most important to older adults. Level A factors (most important) were identified as fun, satisfaction, commitment, and energize. Level B factors included safety, learning, awareness, and productive while level C factors were related to meaningful contribution, intensity, and motivation. In general, it was found that certain factors are more important than others when

selecting physical activity during older adulthood. Results are discussed in light of these findings and it is concluded that including these factors into physical activity may lead to higher participation rates.

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Dedication

I dedicate this thesis to my husband, Jeff Bowser. Jeff, you encourage and listened during the times I needed it the most. The weekend hikes, late night walks around the block, and 'sushi talk dates' made all the difference. You celebrated with me in my success and supported me when I was faltering. You never once doubted my ability to see my research through to the end.
You own this thesis as much as I do.

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Chapter 1: Introduction

The age cohort of 65 years and above is the fastest growing segment in the Canadian population. It is predicted that from 2005 to 2036, the number of Canadians aged 65 and over will more than double from 4.2 million to 9.8 million (Turcotte & Schellenberg, 2007). Concurrent to the increasing number of older adults, research shows that most are not getting the minimum required amounts of daily physical activity as outlined in the Canadian guidelines and therefore qualify as sedentary (Mechling & Netz, 2009). In addition, O'Brien Cousins (1996) suggested that physical activity participation significantly declines during the aging process, particularly in the female population. Currently, the Canadian Physical Activity Guidelines for older adults recommend 150 minutes of moderate to vigorous physical activity per week (Canadian Society for Exercise Physiology, 2011). Within these guidelines, it is recommended that two days per week focus on muscle building activities and bone strengthening exercises. Activities that stress the muscle and bone include things like lifting weights, body weight exercises, and activities like swimming, running, and cycling. In addition, it is recommended that 150 minutes per week be spread out over several days and include blocks of activity that are at least ten minutes in duration. These recommendations are based on research findings which show that exercise can improve flexibility, strength, and endurance. Additionally, decreased risk for falls, increased independence in performing activities of daily living, increased individual perceptions of health, decreased depression symptoms, and improved overall quality of life are associated with regular physical activity (Canadian

Society for Exercise Physiology, 2011; Gretebeck, Black, Blue, Glickman, Huston, & Gretebeck. 2007).

Although the exact mechanisms of decreased physical activity participation in older adults are unknown, it has been suggested to be the result of changes in preferred physical activities as individuals age. For example, it has been shown that older adults often transition from activities characterized by high intensity and aspects of competition, to activities that revolve around social relationships and enjoyment (Visser, Launer, Deurenberg, & Deeg, 1997). Additionally, there has been some evidence that the exercise meaning and engagement reasons change as individuals age (O'Brien Cousins, 1996). Changes in participation have often been explained by barriers of physical activity (Stiggelbout et al., 2008), however, Bandura (2004) suggests that a number of other factors, which are currently under-studied, affect participation patterns. These studies suggested that while physical activity preferences and influences change as individuals age, it is important to further study a range of factors associated with physical activity selection in older adults to better understand the plethora of reasons they individuals participate in physical activity.

Chapter 2: Literature Review

Understanding physical activity participation during older adulthood is a complex process that includes an in depth examination of many variables. To fully understand the factors related to behaviour change, a strong theoretical foundation helps us explain physical activity behaviour. Additional variables compliment these behaviour change theories to help predict participation in older adults. Together these two factions will lay the foundation on which the current study's research purpose is built.

Behaviour change theories

Many theories exist which aim to explain physical activity participation. Bauman, Sallis, Dzewaltowski, and Owen (2002) completed an in-depth review of theories and models used to identify the psychological, cognitive, social, and emotional variables that influence physical activity participation across the lifespan. Examples of these variables include activities which affect enjoyment, intellectual challenge, and a person's self-efficacy. The authors concluded that the main theories used in physical activity research are the health belief model, the theory of planned behaviour, the social cognitive theory, and the transtheoretical model. Bauman et al. (2002) summarized the research by outlining the correlates associated with physical activity participation across the lifespan. Additionally, they tallied the variables related to the theories mentioned above to variables with consistent evidence of association with physical activity. Interestingly, only 25% of the variables matched with the health belief model, 67% aligned with the theory of planned behaviour, 70% followed social cognitive

theory, and 100% of the physical activity variables fit with the transtheoretical model (Bauman et al., 2002). An additional fifteen variables were not accounted for by any theory or combination of theories. This implies that the multidimensional construct of physical activity participation is too complex for a single theory to manage. To this effect, Bauman et al., (2002) suggested that "perhaps progress at the current stage of understanding would best be served by a continued application of existing theories supplemented by creative thinking to evaluate influencing variables that are outside of current theories" (p. 12). Based on this conclusion, the goal of the current research is to take a novel approach to studying physical activity participation in older adults by determining which additional factors play a role in physical activity selection with hopes of understanding how they relate to participation. For the purpose of this study, the operational definition of factors is elements of physical activity that influence participation or non-participation in the older adult population. Although investigating the mechanisms of participation changes in older adults is a topic deserving of more research attention, we are unaware of any studies which have investigated physical activity factors using this definition, and not including barriers to physical activity, as correlates of participation in older adults.

The health belief model, social cognitive theory, and the transtheoretical model are three theories used to understand why individuals either participate or not in a wide range of health and physical activity related actions. The health belief model is based on the concept that health related behaviour is based on the desire to avoid illness (or if already ill, to be well) and the belief that a specific

health action will prevent (or lessen the likelihood of) illness (Janz & Becker, 1984). Alternatively, social cognitive theory attempts to pinpoint participation determinants (Bandura, 1986). Specifically, participation is likely to occur when an individual highly values their health (incentive), believes that exercise participation will lead to health benefits and when harmful effects are unlikely (benefits/risks), believe they are physically capable of performing the activity successfully (efficacy), and perceive that those around them will support their decision (support) (O'Brien Cousins, 1996). Finally, the transtheoretical model suggests that as individuals venture to make changes to their lives, in this case by beginning exercise, they will follow five stages of change. These are pre-contemplation (not intending to make a change), contemplation (considering making a change), preparation (beginning to make small changes), action (actively engaging in new behaviour), and maintenance (sustaining the change over time) (Prochaska & Di Clemente, 1982, 1983; Stiggelbout, Hopman-Rock, & van Mechelen, 2008). Although originally used to study smoking habits, the transtheoretical model has since been widely used to study health and exercise behaviour (Fuller, Stewart-Williams, & Byles 2010; Prochaska, Johnson, & Lee, 2009).

Fuller and colleagues (2010) conducted research utilizing the health belief model, social cognitive theory, and the transtheoretcial model to understand physical activity participation levels of older adults with and without chronic heart or lung disease. The main objective was to understand physical activity aspects (i.e., social support, motivation, and family influence) that enhance or impede

participation levels and to develop a framework of health behaviour for active living. The 99 participants were separated into two groups: 35 males and 46 females who did not have chronic lung or heart disease and 7 males and 11 females who did have chronic disease. Those without chronic disease were all above 50 years of age while those with chronic disease were aged 60 years and above (range not reported).

The focus group interviews that followed relied on theoretical viewpoints from the different models. More specifically, the transtheoretical model was used to examine an individual's readiness to act on new health behaviours while the health belief model and transtheoretical model examined attitudes and beliefs, and self-efficacy, respectively (Fuller et al., 2010). Results indicated that participants identified a number of elements that they found important to promote and maintain health. These included intrinsic variables such as exercise, mental attitude, and setting goals for yourself, while extrinsic variables included being outside, social contact, and support/motivation from family and friends (Fuller et al., 2010). In addition, Fuller et al., (2010) took these intrinsic and extrinsic variables and suggested subgroups. The subgroups include attitudes and strategies, skills and knowledge, social support and motivation, managing physical activity in daily life, family influences, healthcare providers, perceived barriers, and supportive environments. The overall consensus showed that preferred activities would be unstructured in nature and participants were less likely to participate if the activity required travel time and membership fees. However, a large difference was noticed in one area between those with and

without chronic disease. Those without chronic disease preferred activities that focused on social interaction while those with disease tended to separate physical activity from social interaction. Many individuals with chronic disease were fearful for straying far from home while being physically active because of the anxiety of a medical emergency possibly happening. Generally, this study shows that there are many intrinsic and extrinsic variables associated with participation. However, the presence of disease can have an impact on participation, which stresses the importance of having an individualized approach to activity selection. They recommend that future research include a variety of qualitative methods to better understand physical activity participation in older adults (Fuller et al. 2010).

Another theory that helps explain physical activity participation is the theory of planned behaviour. It suggests that a person's intention to perform a particular behaviour is the most immediate determinant and best independent predictor of a person's future behaviour (Godin, 1993; Gretebeck et al., 2007). Within the theory, behavioural intention is the amount of willingness to try and the amount of effort a person is planning to exert to accomplish the behaviour (Gretebeck et al., 2007). This implies that the stronger the intention, the more likely they will perform that behaviour. The theory of planned behaviour has three specific independent determinants of intention. First, *perceived behavioural control* is a person's belief of the difficulty or ease of completing the behaviour based on past experiences, barriers, and resources. Second, *attitude* is defined as the positive or negative evaluation or view of the behaviour (i.e. "good" or

"bad"). Finally, s*ubjective norms* are the perceived pressure from important people in the individual's life to perform the behaviour. Of these three determinants, it has been found that attitude and perceived behavioural control (intrinsic variables) are significant contributors to participation, while subjective norms (extrinsic variable) generally do not strongly influence intention toward physical activity behaviours (Godin, 1993; Gretebeck et al., 2007). The findings that intrinsic variables, such as attitude, have a stronger influence on behaviour than extrinsic variables, such as pressure from others, suggest that a person's sense of control may be more important than the environment in predicting behaviour. Further to these theoretical underpinnings, much work has been done to quantify intrinsic and extrinsic variables into barriers (variables that inhibit physical activity participation) and facilitators (variables that encourage participation). These variables explain why individuals participate or not in physical activity, and they are important to consider.

Barriers and Facilitators

Barriers and facilitators are known to play a significant role in explaining physical activity participation for older adults (Bethancourt, Rosenberg, Beatty, & Arterburn, 2014). In their study, Bethancourt et al., (2014) found that barriers to physical activity programs included poor health, lack of professional guidance, and inadequate dissemination of information on available programs. The facilitators included motivation to maintain physical and mental health, as well as access to stimulating and accessible physical activity programs. Earlier research by Stiggelbout et al. (2008) suggested that three groups of items affect structured

physical activity participation in older adults. These items are *personal factors* (i.e., age, sex, socioeconomic status), *social and cultural factors* (i.e., social support of family and friends, influence of physician), and *environmental factors* (i.e., access to physical activity, travel time). Whether each factor is a barrier or facilitator depends on the individuals status within it. For example, a facilitating social/cultural variable would be a physician who prescribes or encourages exercise to improve health. A social/cultural barrier would be friends and family who are not supportive or encouraging of physical activity. Specific to the older adult population, Schutzer and Graves (2004) identified additional barriers and facilitators that need to be considered. These additional barriers included *health* (i.e., pain, disease), *knowledge* (lack of understanding, awareness), and *childhood exercise* (i.e., experiences as a child). Additional facilitators include *self-efficacy* (i.e., expectations and outcomes, group cohesion, social cognitive theory), *prompts* (i.e., informational mailings, telephone consultation), *music* (i.e., decreases perception of difficulty, monotony and discomfort), and *demographics* (i.e., age, sex, race, past history). The literature surrounding facilitators and barriers helps us understand why individuals of all ages participate or not in physical activity or sport. However, focusing solely on barriers and facilitators does not provide information about an individual's desire to participate. For example, although it may be valid to cite limited financial resources (i.e., a personal factor) as a barrier to participating in golf, a person without the resources may still value certain aspects of that activity (i.e., socialization) despite their inability to afford to play. Therefore, it is important to move beyond

barriers and facilitators to understand the desirable factors of physical activity. Identification of these factors could help individuals identify which activities possess desirable factors and potentially increase participation rates. If we fail to identify these factors, activities that appeal to would-be participants may be dismissed, especially if they are seen as perceived barrier. By studying different factors that help us move beyond barriers and facilitators, it may be possible to help older adults increase their participation by matching them with activities that contain their preferred factors. In order to achieve this goal, it is important to understand behaviour from a holistic perspective. A bio-ecological lens may be used to further dissect behaviour patterns (Bronfenbrenner & Morris, 1998).

Bio-ecological model

A bio-ecological framework helps us understand how the individual and environment interact to affect behaviour (Bronfenbrenner & Ceci, 1994). By including an analysis of environmental factors, we can gather a broader understanding of why behaviours are produced. For example, if it is found that a community has a number of programs that encourage physical activity, it would be expected that individuals residing within that community will be more active than individuals in a community that does not promote participation. Bronfenbrenner and Morris' (1998) bio-ecological theory of human development explains behaviour through four systems that interact and influence individuals. The theory’s systems, which range from the individual to the culture, include the microsystem, mesosystem, exosystem, and macrosystem. First, the microsystem represents a person's immediate environment and includes the different contexts

he/she encounters over time (i.e., home, work, etc.). Second, the mesosystem links the interactions experienced across the different microsystems. For example, an individual's experiences at home will affect in individual's experiences at work. Third, the exosystem environment does not include the individual themselves, but influences an environment which does have direct contact with the individual. An example would be a healthy workplace initiative at an adult child's workplace. It does not directly affect the older adult, but the practices from the child's work may carry over to affect lifestyle habits of the older adult. Finally, the macrosystem is comprised of the overall patterns of society and includes governmental policies and social constructs (Bronfenbrenner, 1977).

To tie all these systems together we can conceptualize an older adult woman's physical activity through a bio-ecological lens. Her activity will be influenced by a range of variables that will ultimately explain her behaviour. First, her interactions with her husband and her children represent two different microsystems. The experiences she receives from the two different microsystems will interact to represent the mesosystem. Her spouse and children's own experiences with their respective microsystems will influence her and represent the exosystem, while available programs funded by the provincial government represent her macrosystem.

In addition to the different systems, the bio-ecological theory has four principle elements which have an interactive relationship: process, person, context, and time (PPCT model) (Bronfenbrenner, 2001; Bronfenbrenner &

Morris, 1998). Process (also known as proximal processes) represents the interactions between the individual and their environment that becomes more complex as interactions increase over time (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 1998; Garcia Bengoechea, 2002). The person aspect attempts to fill the gaps surrounding the previously ignored characteristics of the person in favour of the environment. Bronfenbrenner and Morris (1998) outlined three individual-based characteristics which are the person's disposition, their resources, and the demands placed on them. By considering the person's individual characteristics, we are able to treat these as dependant variables and precursors and producers of future development (Garcia Bengoechea, 2002). Context is one of the original pillars of Bronfenbrenner's (1977) model and is presented as the nested hierarchical structure of the systems. It represents the different environments (i.e., systems) with which an individual interacts. Finally, time suggests that for development to occur, proximal processes must happen on a regular basis and over an extended period of time (Bronfenbrenner & Morris, 1998). Individuals that participate in a physical activity program regularly are expected to reap the benefits of the activity compared to individuals who participate in a haphazard manner.

Although it is clear that individual and environmental factors affect physical activity participation, a number of additional variables need to be understood. With respect to physical activity participation, enjoyment is well established as a critical factor for participation (Dacey, Baltzell, & Zaichkowsky, 2008; Ruby, Dunn, Perrino, Gillis, & Viel, 2011; Scanlan et al., 1993). Therefore, it is

imperative to fully understand the role of enjoyment prior to studying additional factors.

Enjoyment

As indicated, an important element to participating in physical activity is that it provides enjoyment or "fun". Dacey et al. (2008) posited that in older adults, enjoyment is extremely important and is one of the greatest predictors of sustained physical activity as individuals age. By definition, as it relates to physical activity, enjoyment is a positive emotional response to participating in a physical activity experience and includes generalized feelings such as pleasure, liking, and fun (Scanlan et al., 1993). Yet, the construct of enjoyment runs deeper than simply doing something because it is fun. It plays a complex role in participation and little is known about the development of enjoyment in physical activity in older adults (Mullen et al., 2011). Ruby et al., (2011) proposed that individuals may not participate in physical activity because they fail to fully appreciate how much they will enjoy it. This is an important issue considering expected enjoyment from physical activities can increase exercise intentions (Ruby et al., 2011). To test this hypothesis Ruby et al., (2011) used a multiple study design to quantify various aspects of enjoyment by having 279 participants predict how much they would enjoy an upcoming physical activity session, and asking about enjoyment after finishing a session. When asked about how they would enjoy the physical activity as a whole, many focused on beginning the exercise, which lowered perception of enjoyment due to the taxing nature of starting to exercise from rest. However, when the focus spanned the entire

activity segment (beginning, middle, and end) individuals had a much higher enjoyment rating. Overall, it was found that the largest barrier to enjoyment was the anticipation of the unpleasant beginning of any exercise routine. The results from their study indicate that enjoyment plays a large role in intent to participate again in the future, suggesting that maximizing perceived enjoyment of an activity is critical. Ruby et al., (2001) suggested increasing positivity at the beginning of the activity and focusing individual's attention across the entirety of the experience.

Finally, a study by Dacey et al., (2008) found that in 645 older adults aged 50+ years (M age = 63.8) the importance of enjoyment rose significantly as the level of activity increased. That is, for those who were inactive, enjoyment was less important than for individuals who fell into the active and sustained maintenance activity categories. These findings suggest that while important regardless of current activity status, enjoyment becomes increasingly important as time involved progresses. This supports the bio-ecological model's construct of time, which says that for development to occur, it must happen over an extended period of time.

In addition to the development of enjoyment, time also affects individual's beliefs about themselves. As individuals age, their views of how "successfully" they are doing is influenced by a number of factors. These factors, which represents ones view of aging, serve as predictors of their participation in physical activity.

Beliefs of aging

A person's perception of themselves plays an important role in healthy aging during older adulthood. Many theories exist within this construct and each predict how personal beliefs and physical activity affect overall wellness. One important definition used to describe this is successful aging. It is defined as longevity with high levels of physical, mental, and social well-being (Vaillant & Mukamal, 2001). Alternatively, Rowe and Kahn (1997) define successful aging in three main spheres: low probability of disease and disease-related disability, high cognitive and physical functioning, and active engagement with life. Both definitions suggest that physical, mental, and social health are key constructs in successful aging.

In a recent study, Meisner, Weir, and Baker (2013) studied older adults and the relationship between aging expectations and various modes of physical activity ranging from light activities of daily living (light housework) to intense organized sport and strength and endurance training. In a sample of 247 men and women between the ages of 41-97, they measured physical activity levels and physical health, mental health, and cognitive function. Using the Physical Activity Scale for the Elderly (PASE) and the Expectations Regarding Aging Survey, they explored the influence that aging expectations have on physical activity participation (Meisner et al., 2013). While controlling for socio-economic and health status variables, they found that there was a positive association between aging expectation of physical health and individual's participation in

strenuous sport and recreation. In particular, this was true for those who did not have any restrictions of daily living. These results suggest that in the future, by improving aging expectations, participation in strenuous physical activity could be supported among those who are functionally able.

In addition to improving aging expectations, the way individuals perceive their personal aging is also an important factor. Klusmann, Evers, Schwarzer, and Heuser (2012) conducted a study in successful aging and identified a construct termed "view of one's aging" which is defined as one's positive or negative satisfaction with aging. The authors identify two dimensions that are common in older adults view of one's aging. The first is an *approach orientation* which defines the habits of individuals who tend to practice goal setting, feel success when goals are met, or are mainly intrinsically motivated. The second is an *avoidance orientation* which defines the habits of individuals who are motivated to maintain or prevent further loss of health. Individuals who embrace the approach orientation often evaluate exercise experiences as more positive and meaningful than those focusing on avoidance orientation. This becomes important as a negative view of one's aging is linked with decreased attention to personal healthcare and well being (Klusmann et al., 2012), which could be linked with decreased physical activity in the later years of life.

As individuals age, many focus on loss avoidance and maintenance rather than gains, but this avoidance approach is only effective if the feared loss is preventable (Klusmann et al., 2012). In order to analyse the effects of exercise on view of one's aging, Klusmann et al. (2012) carried out a 6 month study in

which they looked at 247 women 70 aged years and above. These women were assigned to one of three conditions of physical activity (90 minutes, 3 times per week of high intensity activity), a cognitive task (90 minutes, 3 times per week of learning computer skills), or a control group (continued on their usual activities). Results showed that engagements in physical activity positively influenced age satisfaction, which is a measure of view of one's aging. Additionally, it was found that approach orientations led to increased motivation levels in physical activity. This reinforces the notion that exercise can have a positive effect on view of one's aging and may be facilitated through the direct approach orientation, which lends credibility to the thought that engaging in physical activity is beneficial for view of one's aging. Additionally, the attitudes in the group of exercisers remained significantly more positive irrespective of the amount of physical activity suggesting that any physical activity is better than none. These findings build on the work of Denk and Pache (1999) who identified that physically inactive individual's attitudes towards aging, especially in women, were negative and became increasingly negative with age. Combined, these results indicate that physical activity can serve as a buffer against negative perceptions of aging, and vice versa.

Many complex interactions contribute to a successful aging outcome. In a recent study by Henderson, Casper, Wilson, and Dern (2012), participants (n = 408, age range = 55-94, median age = 69 years) of the North Carolina Senior Games (NCSG) were asked to rank 11 items on how important each item was to them. They used a 5-point Likert Scale (5 = very important to 1 = very

unimportant) to identify the six most important reasons for participating. The top six reasons were as follows: *fun* (M = 4.69, SD = 0.56)*, health* (M = 4.40, SD = 0.66)*, social* (M = 4.26, SD = 0.79)*, competition* (M=4.15, SD = 0.56)*, creative expression* (M = 3.64, SD = 0.79)*,* and *doctor recommendation* (M = 3.07, SD = 1.33)*.* Much literature supports the concept of enjoyment as an essential component of physical activity participation in older adults. Additionally, enjoyment also plays a role in increased exercise participation (Mullen et al., 2011; Rowe & Kahn, 1987; Ruby, et al., 2011; Vaillant & Mukamal, 2001). Although these reasons offer preliminary information about the different factors linked to activity selection, further information is necessary to fully understand the nature of physical activity during older adulthood.

Purpose

Based on the information outlined above, the purpose of the present study was to investigate the factors of physical activities considered important by older adults aged 65 to 75. This age group was selected because it is the age range following usual retirement. By determining influencing factors for this age range, interventions can be implemented earlier in an attempt to produce beneficial affects before older adulthood. Identification of the factors will address the gap outlined by Bauman et al. (2002) who called for creative approaches to studying physical activity in older adults. This will provide us with important information which can help programmers tailored to the aging population with activities that match the desires of this age group. Research on this topic is timely and relevant given that the oldest of baby-boomers are now entering retirement age.

Researchers suggest that in 2009 alone, the cost of physical inactivity to our health care system in Canada reached $6.8 billion dollars (Janssen, 2012). This research stands to not only benefit the individuals and their families, but also communities, and recreation providers, who may find this research useful for program development and implementation.

Chapter 3: Methods

Two phases of data collection were used in this study. The purpose of phase one was to collect preliminary information on which factors play a role in physical activity selection or non-selection. The purpose of phase two was to quantify which factors identified in phase one were the most important factors across different types of physical activities.

Prior to beginning data collection, we relied on Bandura's (2004) social-cognitive research on health promotion to gather preliminary information on physical activity selection. This research addresses the core determinants of participation such as knowledge, outcome expectations, barriers, and facilitators. In his work, Bandura (2004) frequently referenced "other factors", however indicated these are not effectively named or defined by current research. Therefore, as outlined above, the purpose of this study was to address this gap by exploring such factors as they relate to selection or non-selection of different types of physical activities. In order to expand on Bandura's (2004) work, it is imperative to differentiate determinants of participation from these "other factors". Thus, these "other factors" are operationalized as qualities of physical activities that influence an individual's likelihood to participate. An example might be the competitiveness or social aspects of a physical activity.

Phase one of data collection commenced by creating the Physical Activity and Aging Research Committee (PAARC), which will be referred to as the Committee. The Committee was tasked with generating the different factors of physical activity selection, included individuals between the ages of 65-75 years

recruited from Prince Edward Island. Data collection for phase two occurred by gathering groups of individuals to assess the importance of the factors identified in phase one. A detailed description of the methodology for both phases is described below.

Phase one:

Participants

Participants in phase one were recruited in a number of ways. First, organizations within the community (i.e., regional senior groups, learning centres, and sporting groups) that provide activities for older adults were contacted. Each organization sent recruitment information to their members through mailing lists, newspaper inserts, e-mail list-servers, or flyers posted in the facility (See Appendix A for sample recruitment advertisement). Second, oral presentations and a poster board presentation were given by the primary researcher at a local older adults sporting event. Finally, a radio advertisement was used to promote the research study. These modes of recruitment created a snowball sampling procedure as interested participants were encouraged to bring spouses, family members, friends, or neighbours that fit the age criteria. Individuals interested in participating contacted the researcher by e-mail, calling a 1-800 number, or expressing interest in-person.

Seven participants (two males and five females) between the ages of 67 and 75 ($M = 70.3$, $SD = 3.0$) formed the Committee. Of the seven Committee members, six were married/common-law while one was widowed. The group had a high level of education with six participants having a college or university

degree. Six of the seven participants lived with other individuals while all seven participants lived in a rural area. All participants were retired but considered their household income as average or above average compared to a typical family in the province. Overall, the group was in good health with five of the seven participants rating their health as good or excellent and all reported being physically active throughout their lives. Older adults who were physically active provided a unique perspective on physical activity throughout the lifespan. These individuals have successfully continued to be physically active through all life stages therefore, their thoughts on factors of physical activity provided information that could help inform others.

Materials

Participants were provided with a letter of information (Appendix B) and asked to sign a consent form (Appendix C). They then completed a General Demographics and Physical Activity Questionnaire (Appendix D). This questionnaire was used to gather information about participants' age, marital status, education, income, health, and physical activity levels.

Procedure

The Committee met for one three-hour meeting at the University of Prince Edward Island in March, 2013. It was held in a private room to discuss the factors associated with physical activity selection or non-selection. The meeting began by participants introducing themselves to each other. This was done to create a comfortable environment for the discussion to occur. The primary researcher then introduced herself, along with a research assistant who was present to take

notes during the session. Following introductions, participants were given a verbal synopsis of the letter of information and asked to provide consent for participation in the study. With consent obtained, participants completed the Demographic and Physical Activity Questionnaire described above. This was followed by the researcher explaining that the meeting would focus on participants' thoughts regarding factors associated with physical activity selection. Background information on the research investigating barriers and facilitators (Schutzer & Graves, 2004; Stiggelbout et al., 2008) was provided to clarify how barriers and facilitators differ from physical activity factors. Participants provided verbal confirmation that they understood the difference between factors and the barriers and facilitators and were provided with an opportunity to ask questions.

The Committee's first task was to generate a list of factors that affect activity selection. As outlined above, a factor is an element of physical activity that plays a role in selection or non-selection of the activity. Examples of factors include, but are not limited to, socialization with other participants, feelings of enjoyment, and being challenged by the activity. Therefore, the committee was asked to create an exhaustive list of factors that pertain to physical activity selection. The group was also told to consider various types of physical activities such as going for a walk, biking, home renovations, gardening, along with conventional sports like soccer, hockey, and curling. As the discussion progressed and factors emerged, the researcher wrote each one on a whiteboard while the discussion continued. The researcher encouraged discussion around

topics that could be further developed by suggesting new physical activity scenarios. Once the group agreed that they had exhausted the list of possible factors, the list was considered complete.

The second task for the Committee was to consolidate the factors into a comprehensive list. Some factors were similar to others, which meant they could be grouped together. For example, the items "living in the moment", "seeing flowers", and "feeling the sun", were collapsed and renamed into the factor of "awareness". Others were expanded upon with new factors emerging if one definition did not suffice. For example, the factor “social” was broken down into “interaction casual” and “interaction in depth” to differentiate between very light topics of conversation and those which are much more deep. Once the group agreed that the factors were distinct from each other, the list was considered complete. Table 1 provides a complete list of factors generated by the Committee.

Throughout the discussion, the Committee noted that some factors were better suited to certain types of physical activities than others. For example, they felt that "sport" activities would have different factors than household activities, such as raking leaves. This led the Committee to discuss activities that fall along a continuum of “structured” to “unstructured” activities. Additionally, the Committee determined that the context in which an activity takes place was also a relevant factor. More specifically, whether the activity was undertaken individually or as a group could influence the factors associated with participation. This resulted in a second dimension, dichotomized by “individual”

and “in a group”, as important to selection or non-selection of physical activities. The Committee felt it was important to distinguish between group and individual activities, as they felt some factors were very important if it was a group activity but not important if it was an individual activity, and vice versa. An example of this would be going for a walk. If someone were to be walking alone, then incorporating a hobby such as listening to music would be a viable option. However, should two or more individuals go for a walk, the activity may be influenced by different factors.

After the Committee had completed this discussion, the meeting ended with participants being thanked and told they would be provided with a summary of the findings once the research was complete.

Phase one outcome

Based on the work of the Committee, 25 factors were identified (Table 1). The factors and definitions were conceptualized by the Committee. However, the definitions were refined by the primary researcher following the meeting. Additionally, examples of physical activities were added to the definitions to provide consistent examples of physical activities as they relate to each factor.

Table 1: Complete list of factors with definitions and examples

Factor Definition and Example		
Factor name	Definition	Example
Awareness	Being alert to your surroundings and external elements.	Going for a walk and noticing flowers, birds, berries, etc.
Commitment	Having an obligation to attend physical activity each week because you told others you would.	Having a golf foursome who expects you to be there each week.
Competence	Continually getting better at skills over time.	Reducing score in golf.
Competition	Activities in which there is a winner and loser or a ranking of finishers.	Games which are played and a score is kept.
Creativity	The ability to inject physical activity with your own creative twist.	Dance or doing renovations to your house.
Energize	To feel invigorated by the activity.	Feeling like you have more energy after coming in from a walk in the sunshine.
External motivation	Desire to participate comes from outside rewards.	Desire to win a trophy.
Fun	Providing entertainment or amusement.	Having fun playing a sport.
Hobbies	Activities that are able to happen along with personal interests.	Going for a walk and listening to podcasts or taking your camera to take photos.
Intensity	The amount of energy expended ranging from low to high	A walking speed that allows conversation to long distance running which causes perspiration and makes conversation difficult.
Interaction (casual)	Discussions amongst participants stay very general with broad topics.	Conversation includes topics like the weather, work, etc.
Interaction (in depth)	Discussions amongst participants are much deeper and personal.	Conversation includes topics like ideals, politics, religion, etc.
Internal motivation	Desire to participate comes from personal reasons.	Desire to lose weight or have more energy.

Table 1 continued

Meaningful contribution	Having an outcome that makes a difference to the betterment of a community or group.	Habitat For Humanity house building.
Mental (full engagement)	Requiring high levels of concentration on a task.	Preparing for a challenging golf shot
Mental (mindless)	Requiring very little mental concentration	Raking leaves
Productive	Working toward a specific outcome while being physically active.	Planting a vegetable garden
Regularly scheduled	Meeting(s) is at a particular time and day	Mondays from 2-3pm
Safety	Consideration given to personal safety from external factors.	Going for a walk with others in case you might fall, encounter a threatening person, etc.
Satisfaction/fulfillment	Feelings of having accomplished something worthwhile.	Beating your personal best or completing a project you've been working on
Self-efficacy (mental)	The belief that you are/are not mentally able to do the activity successfully.	"I am/am not able to learn all the rules and techniques in golf
Self-efficacy (physical)	The belief that you are/are not physically able to do the activity successfully.	"I am/am not flexible enough to curl"
Spiritual/meditation	Allowing participant time to reflect and relax.	Going for a walk on the beach
Team	Working with other individual to accomplish a physical activity.	Curling team, hockey team, etc.

Phase two:

Participants

Participant recruitment for phase two followed the same process as in *phase one*. This resulted in 45 participants (10 males and 35 females) aged 64-79 years (M = 69.3, SD = 3.6) participating in the second phase of the study. The results of the demographics questionnaire demonstrated that 24 participants (53.3%) were married while 20 (44.4%) were widowed, divorced, or never married, with one participant not reporting their marital status. Participants reported having a mix of education levels with 15 (33.3%) having high school or less, 19 (42.2%) having attended trade school or receiving a college diploma, and 11 (24.4%) having a university degree or higher. Twenty-three participants (51.1%) lived in a rural area while 22 (48.8%) lived in an urban area. The distribution of income was similar across groups with 10 individuals (22.2%) earning under $24,999, 12 (26.7%) earning $25,000 - $49,999, and 10 (22.2%) individuals earning more than $50,000. However, 13 individuals (28.8%) did not report their income level. Only 3 participants (6.7%) reported having no health conditions and 31 participants (68.9%) indicated being active during their entire lives.

Materials

As per phase one, the materials included a letter of information (Appendix B), consent form (Appendix C), and the General Demographics and Physical Activity Questionnaire (Appendix D).

In addition to the materials listed above, participants were provided with a list of factor definitions and examples (Table 1). This sheet included the factors identified in phase one, a definition of each factor, and an example as it pertains to physical activity. This ensured that each factor was consistently operationalized for every participant.

To address the dimensions of structured vs. unstructured and individual vs. group physical activity differences, a four category design was created (Figure 1). A dimension is defined as one of the four constructs that are used in combination to create a category. Individual, group, structured, and unstructured are the four dimensions while the categories are defined as group structured, group unstructured, individual structured, and individual unstructured. This provided a framework with which participants could discuss the factors most important to participation within specific dimensions.

Finally, to rate the level of importance of each factor within a category, a generalized visual analogue scale (Hayes, Allen, & Bennett, 2013) was used (Appendix F). The generalized visual analogue scale consists of a 10-centimeter line anchored by “least important” and “most important”. This method was selected because it is commonly used as a scale where it is difficult to compare ideas, feelings, or thoughts within participants (Hayes et al., 2013). For example, it has been used to quantify fear of falling in community dwelling older adults (Karinkanta et al., 2012).

Structured	Unstructured
Individual	**Group**

Figure 1: Four dimensions used to create the four category design of physical activity classifications.

Procedure

Recruited participants were provided with a meeting time and place, with most meetings happening from April to July of 2013. Participants met as small groups (two to eight participants per group), however one participant completed the study alone due to other participants not showing up for the pre-determined session. The data collection process for this phase of the study lasted for approximately one to one and a half hours. Upon arrival, participants were given a verbal summary of the letter of information (Appendix B) and provided with a copy of the letter of information and informed consent (Appendix C). Participants were then asked to complete the General Demographics and Physical Activity Questionnaire (Appendix D). Upon completion, participants were given a verbal summary of the first phase of data collection and provided with an opportunity to ask questions. With this background understood, participants received the list of factors and definitions generated from phase one (Table 1). The factors were presented to participants in alphabetical or reverse alphabetical order to prevent order bias.

Once the factors and dimensions were understood, participants were provided with sheets that represent the four categories (Appendix E). These were

explained in terms of (i) structured: having rules, a winner/loser, a specific time and place to participate, (ii) unstructured: no rules, no specific time or place to play, no winners/losers, (iii) individual: does not happen as team, is a solitary activity, and (iv) group: consisting of a group of individual who work together to accomplish the activity. An example of each activity was given, and these remained constant through all groups to maintain consistent understanding. The examples were as follows: group–structured: curling; group–unstructured: walking club; individual–structured: marathon running/biking; and individual–unstructured: gardening. Participants who requested further clarification were provided with additional information as needed. The researcher then wrote the name of the category being discussed on the whiteboard along with the accompanying example. The order in which the categories were presented to the groups was counter-balanced (see Appendix G for counter-balance schedule) to minimize order effects. Within each category, participants were asked to consider the relevance of each factor identified in phase 1 when deciding to participate or not in this activity type. This exercise was done for the 25 factors across the four categories. For a factor to be included in the list, only one participant had to indicate that they felt it was important. Factors that were not identified as important for a given category were left off the recording sheet.

Once the four categories were populated with the list of important factors, each participant was asked to rate the importance of each factor. This was achieved by participants marking the 10 cm generalized visual analogue scale line next to each factor in accordance to the perceived importance they allocated

to the factor as it related to that category of physical activity. Finally, for each of the categories, participants were then asked to rank their top five most important factors, from 1 (most important) to 5 (fifth most important). Upon conclusion of these tasks, the meeting was concluded with a debriefing and thank you. Participants were given the opportunity to ask questions and were told that a summary of the results would be provided once the research was complete.

Data analysis

Data analysis began by measuring the generalized visual analogue scale lines for each factor across the four categories. Following this, in each of the four categories, the respondents listed the factors of participation in each physical activity. The five most frequently identified factors across all respondents were noted in each of the four categories. To quantify the number of times each factor was ranked in the top five factors for each respondent, a Frequency of Rank (FoR) score was calculated for each factor. For instance, for a given category, if a factor was ranked 23 times, regardless of what the rank number was, then the FoR score would be 23. For each factor listed within a category, the following data points were recorded a) the name of the factors identified within the category, b) the length of the line that had been marked on the 10 cm scale for each factor, and c) the rank of each factor. Mean line lengths and standard deviations were calculated for each factor within each category.

The first step in the analyses was to determine if the ranking of factors was different between each category. The Cochran–Mantel–Haenszel chi–square test was used to investigate the differences between categories on the

order of ranks. Once it was established that there was a difference in the rankings between categories, it was important to determine how factors were ranked within each category.

The second analysis investigated differences within categories to determine which factors were most important. To investigate the importance of factors within categories, the FoR score for each factor was used to determine the proportion score, and in turn, calculate the 95% confidence interval upper and lower limits for each factor. Table 2 provides a summary of the factors within each category along with the FoR scores for each factor. The alpha value for this analysis was set at .05. Confidence interval scores that spanned zero indicate that the factor was not considered important while confidence intervals that were above zero indicate that the factor was considered important. Additionally, confidence intervals were compared between important factors to determine the relative importance of each factor within each category.

Chapter 4: Results

The Frequency of Rank score was used to calculate the ranks, proportions, and confidence intervals for all factors within each category. The original intent for exploring mean line length was to quantify how important an individual factor was to a participant. Although computed, the mean line length was not used in this analysis due to large discrepancies between the line lengths and rank scores. This decision to omit line length as a measure was based on observations made during the data collection where participants placed greater importance on ranking factors than attributing them a rating on the generalized visual analogue scale line. Overall, participants took much time and consideration when allocating their top 5 ranks in each category. They consulted the definition and example lists, and many made notations before deciding on the final ranking. The care and attention that was given to the rank order was noticeably more than the generalized visual analogue scale line marking, so it was decided that the rankings are more indicative of the true list of important factors.

The first analysis compared the four categories across the 25 factors (25x4 matrix). The chi-square goodness of fit test was used to evaluate the distributions of the responses to the reason for involvement in physical activity across the four categories. The result of this analysis showed that there was a significant difference between the distributions of responses across the four categories ($\chi^2 = 75.9$, $p < 0.001$). This difference indicates that the rankings of factors differed across categories and that the responses were not ranked in a

constant manner across the categories. As a result, each of the four response categories was subsequently evaluated independently to gain a better understanding of which factors were considered most important within each category. Table 2 provides a list summary of the factors within each category, along with the FoR scores for each factor.

Table 2: Frequency of Rank score of factors by category.

Group Unstructured	Individual Unstructured	Individual Structured	Group Structured
Fun (33)	Fun (30)	Fun (32)	Fun (30)
Satisfaction (22)	Satisfaction (20)	Satisfaction (23)	Commitment (21)
Energize (19)	Energize (18)	Safety (19)	Satisfaction (16)
Awareness (16)	Learning (17)	Commitment (17)	Safety (15)
Safety (15)	Awareness (15)	Learning (16)	Team (15)
Commitment (15)	Safety (15)	Energize (14)	Learning (14)
Learning (15)	Productive (15)	Competence (12)	Competence (11)
Productive (11)	Creativity (14)	Awareness (11)	Competition (11)
Hobbies (11)	Spiritual (13)	Productive (10)	Energize (9)
Spiritual (10)	Internal motivation (13)	Internal motivation (9)	Awareness (8)
Interaction casual (10)	Hobbies (10)	Regularly scheduled (8)	Internal motivation (8)
Internal motivation (9)	Commitment (9)	Hobbies (7)	Self-efficacy physical (8)
Competence (8)	Meaningful contribution (8)	Meaningful contribution (7)	Productive (7)
Regularly scheduled (7)	Self-efficacy physical (5)	Team (6)	Regularly scheduled (7)
Meaningful contribution (6)	Intensity (5)	Creativity (5)	Hobbies (6)
Team (3)	Mental mindless (5)	Spiritual (5)	Meaningful contribution (6)
Self-efficacy physical (3)	Competence (4)	Competition (4)	Mental full (5)
Intensity (3)	Mental full (3)	Self-efficacy physical (4)	Self-efficacy mental (5)
Competition (2)	Regularly scheduled (2)	External motivation (4)	External motivation (4)
Self-efficacy mental (2)	Self-efficacy mental (2)	Mental full (3)	Intensity (4)
Interaction in depth (2)	Team (1)	Self-efficacy mental (2)	Interaction casual (4)
Creativity (1)	Interaction casual (0)	Intensity (2)	Creativity (2)
Mental full (1)	Competition (0)	Interaction casual (2)	Interaction in depth (2)
Mental mindless (1)	Interaction in depth (0)	Mental mindless (2)	Spiritual (2)
External motivation (0)	External motivation (0)	Interaction in depth (0)	Mental mindless (0)

Proportional Estimates to Score Descriptors:

To investigate the importance of factors within categories, the FoR score for each factor was used to determine the proportion score, and in turn, calculate the 95% confidence interval upper and lower limits for each factor. A proportion score representing the number of times a factor was identified as one of the five most important factors related to physical activity participation within one of the four main categories was created. The proportion scores were derived by counting the number of times the factor was identified as being ranked one of the top 5 influencers for pursuing the physical activity, dividing the count by 45 (number of participants) and multiplying the ratio by 100 to determine the percent of respondents that ranked that factor as being important. Following the identification of the proportion, the 95% confidence interval for each proportional estimate was computed. Figures 2 – 5 present the proportional estimates and corresponding 95% confidence intervals within each of the categories for rating physical activity pursuits. As mentioned above, a factor with a confidence interval that spanned zero was considered non-significant and was not reported in the results. Factors that had a confidence interval not including zero were considered important and are therefore reported. Following this, an investigation of important factors within each category was undertaken. Results are presented below by category.

Individual unstructured category

Out of the 25 factors, 17 were rated as important for the category of individual unstructured activities. The proportions for these factors range from

8.9% to 66.7%, while the upper limits span 17.2 (competence) to 80.4 (fun) and the lower limits span 0.6 and 52.9, respectively. By looking at the upper and lower limits, fun is the factor most often rated as important. However, it is not significantly different than the factor of satisfaction or energize, but is significantly different than all of the other factors. Satisfaction has a lower limit of 29.9% which means it is rated as significantly more important than the 5 lowest ranked factors. Energize and learning are significantly different than the 4 lowest ranked factors. Awareness, productive, learning, and creativity are not different from each other, but all are significantly different than competence, the lowest ranked factor. The remaining 9 factors are not significantly different from each other.

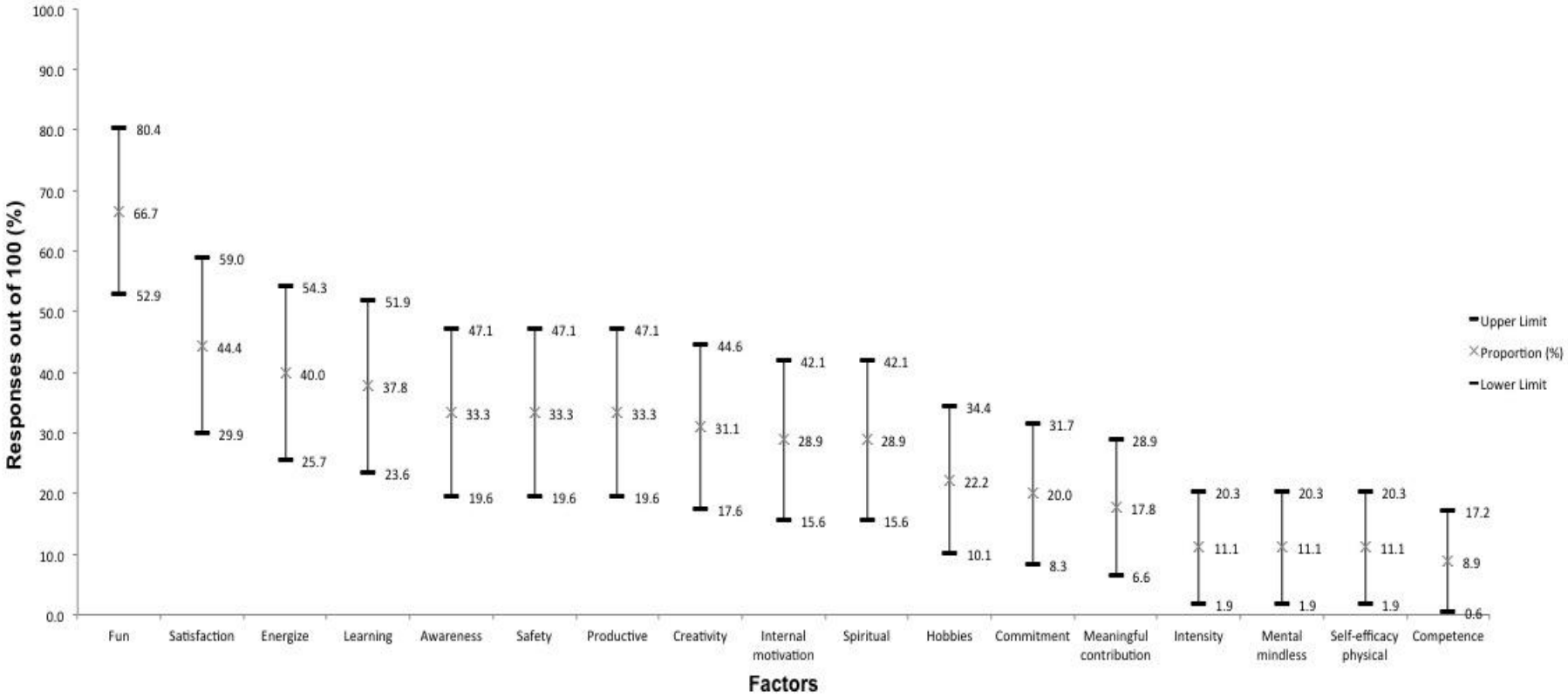

Figure 2: Individual Unstructured Proportion and Confidence Intervals

Individual structured category

The category of individual structured physical activities contains 19 of the 25 factors. The factor of fun has the highest proportion (71.1%) while competition, external motivation, and self-efficacy physical have the lowest proportion (8.9%). The upper limit ranges from 17.2 (competition, external motivation, and self efficacy physical) to 84.4 (fun), while the lower limits span 0.6 to 57.9, respectively. Comparisons of factors show that fun is rated as important as satisfaction however, fun is significantly more important that the remaining factors. Satisfaction is significantly more important than the 11 factors which are ranked the lowest. Safety is significantly different than the 8 lowest ranked factors whereas commitment and learning are rated of equal importance but they are significantly different than the 5 lowest scored factors. The factor of energize is significantly more important than the 3 least important factors. Finally, the remaining 13 factors are all equally important.

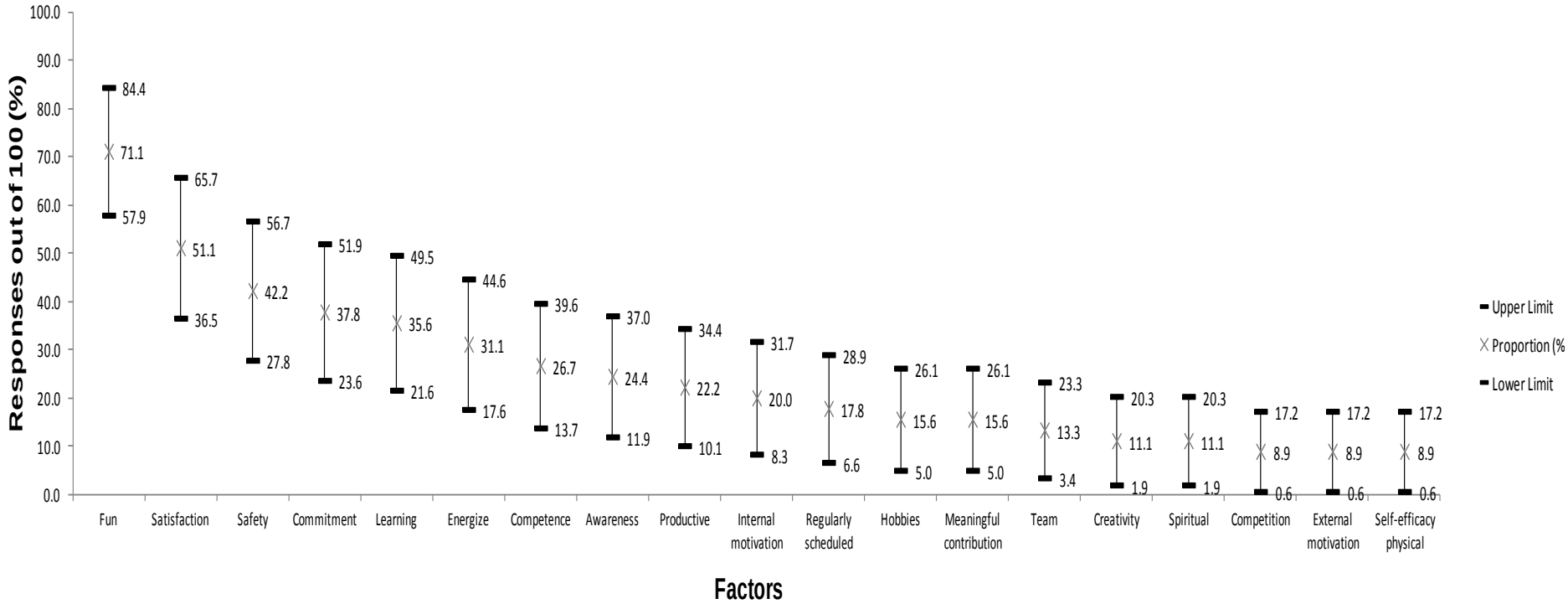

Figure 3: Individual Structured Proportion and Confidence Intervals

Group structured category

The group structured category contains 21 of 25 possible factors. The factor of fun has the highest proportion (66.7%) while external motivation, intensity, and interaction casual have the lowest (8.9%). Figure 4 shows that the upper limit ranges from 17.2% (external motivation, intensity, and interaction casual) to 80.4% (fun), while the lower limits range from 0.6 to 52.9. Fun is not significantly different than the next most ranked factor, commitment. It is however, significantly different than all other factors. Results suggest that commitment is significantly more important than the 13 lowest ranked factors while satisfaction is significantly larger than the 5 lowest ranked factors. Safety, team, and learning are not different from each other but are significantly more important that the 3 lowest ranked factors. The remaining 15 factors are not significantly different from each other.

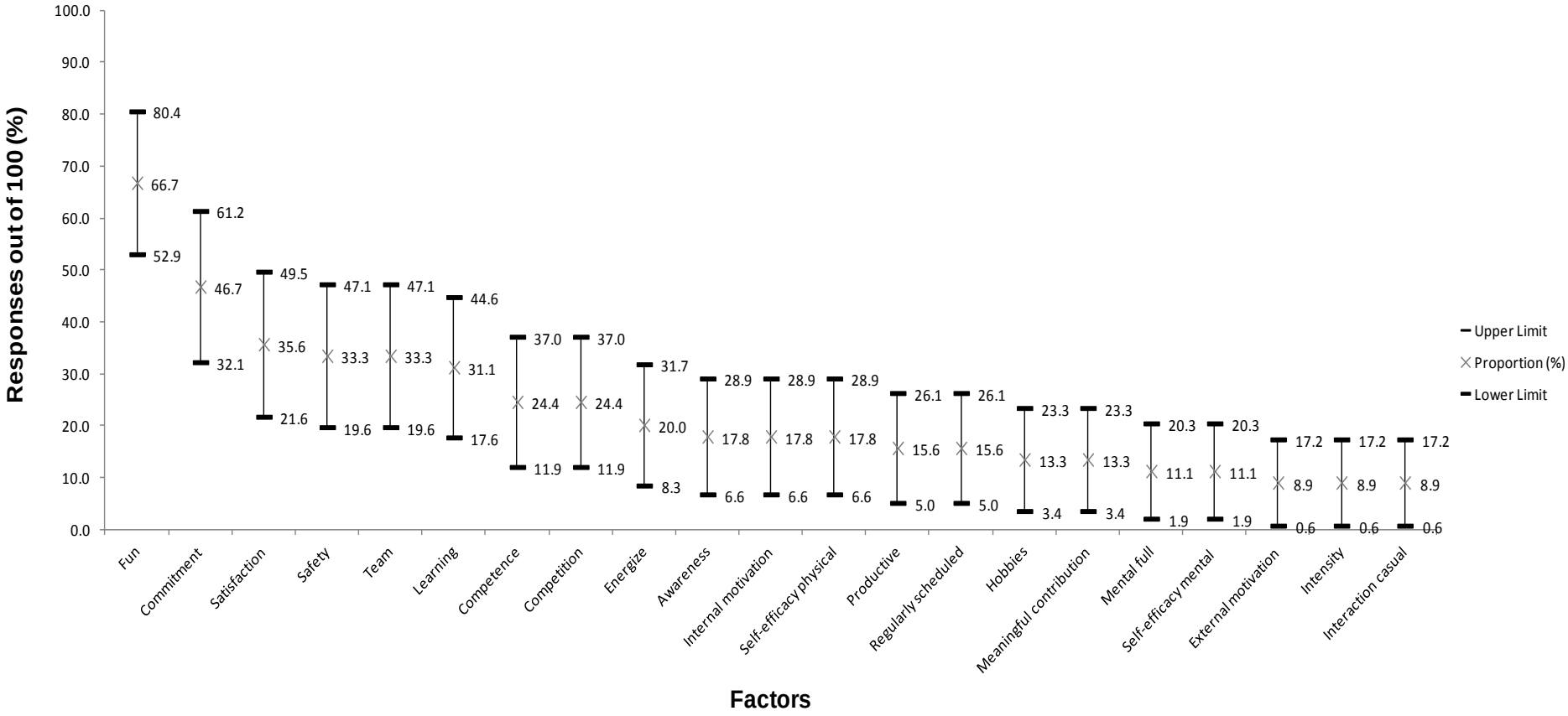

Figure 4: Group Structured Proportion and Confidence Intervals

Group unstructured category

The group unstructured category has the least factors qualifying for inclusion with 15 of a possible 25 being included. Fun has the highest proportion with 73.3% and meaningful contribution has the lowest with 13.3%. The upper limit ranges from 23.3 (meaningful contribution) to 86.3 (fun) and lower limits from 3.4 to 60.4, respectively. Again, fun is not significantly different than satisfaction, but is significantly different than the other factors. Satisfaction is significantly more important than the 4 lowest ranked factors whereas energize is significantly different than the last 2 factors. All of the remaining 12 factors are not significantly different.

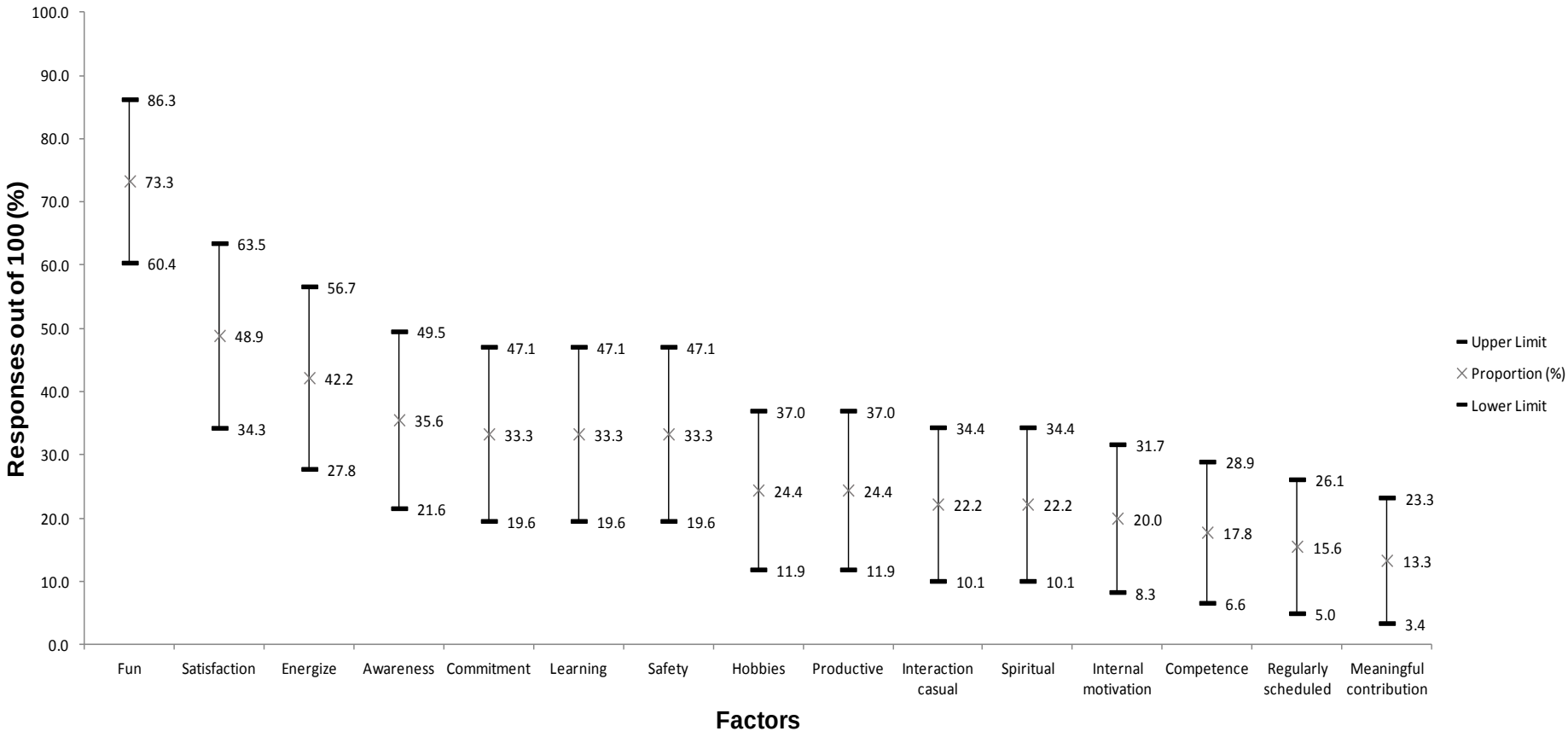

Figure 5: Group Unstructured Proportion and Confidence Intervals

Within categories

In order to determine which factors were the most important within each category, levels were created to group factors with similar levels of importance (see Table 3). Starting with the factor with the highest proportion, subsequent factors which were not significantly different than this first factor were included in level A. Once a factor was identified as being significantly different than the factor with the highest proportion, a new level (B) was identified. The factor identified as being significantly different than the top factor in level A, was then used to determine the next cut off. Factors which were not significantly different from this factor were all contained in level B. This continued until the list of factors was exhausted and there were no new levels. All four categories contained three levels of factors.

Level A. Fun was represented in the level A category in all four categories. Satisfaction was found in three, while energize and commitment were each found in one category.

Level B. The factors safety, learning, awareness, and productive were each found in level B for all four categories. Commitment, energize, internal motivation, and competence were each found in three categories. Spiritual, hobbies, regularly scheduled, and meaningful contribution were found in two categories, and self-efficacy physical, competition, and team only being found in one category.

Level C. Intensity, self-efficacy physical, external motivation, and meaningful contribution were all found in 2 categories. Interaction casual, self-

efficacy mental, mental full, team, creativity, spiritual, competition, hobbies, regularly scheduled, and competence were each only found once in level C.

Table 3: Factors by level within categories

Category	Level A	Level B	Level C	Other Factors
Individual Unstructured	Fun Satisfaction Energize	Learning Awareness Safety Productive Creativity Internal mot. Spiritual Hobbies Commitment Meaningful cont.	Intensity Mental min. Self-efficacy phys. Competence	Mental full Regularly sch. Self-efficacy men. Team Competition External mot. Interaction cas. Interaction in depth
Group Unstructured	Fun Satisfaction	Energize Awareness Commitment Learning Safety Hobbies Productive Interaction cas. Spiritual Internal mot. Competence	Regularly sch. Meaningful con.	Intensity Self-efficacy phy. Team Competition Interaction in depth Self-efficacy men. Creativity Mental full Mental min. External mot.
Individual Structured	Fun Satisfaction	Safety Commitment Learning Energize Competence Awareness Productive Internal motivation Regularly sch.	Hobbies Meaningful con. Team Creativity Spiritual Competition External motivation Self-efficacy phy.	Mental full Intensity Interaction cas. Mental min. Self-efficacy men. Interaction in depth
Group Structured	Fun Commitment	Satisfaction Safety Team Learning Competence Competition Energize Awareness Internal mot. Self-efficacy phy. Productive Regularly sch. Hobbies Meaningful con.	Mental full Self-efficacy men. External mot. Intensity Interaction cas.	Creativity Interaction in depth Spiritual Mental min.

Chapter 5: Discussion

The purpose of this study was to understand which factors most influence physical activity selection in older adults aged 65 to 75. By creating a list of factors, analyzing the Frequency of Rank, proportion, upper and lower limit scores, and examining their patterns, this study addresses the gap in the literature which states that “other factors” need to be identified and defined (Bandura, 2004). Findings of the present study are useful to researchers, community members, and program leaders interested in designing exercise programs for older adults and ultimately measuring physical activity preferences in the older adult population.

When investigating the results across the four activity categories, consistent trends were observed. Certain factors consistently ranked high in importance while others consistently ranked mid to low (see Table 3). Even though it was found that the different contexts should be considered independently from one another, results suggests that there is agreement within older adults as to which factors are most important. The findings outline that certain factors need to be considered while others are not of primary importance. By investigating the factors across the different levels, it is possible to further understand which factors are most valued by older adults when selecting physical activities.

Level A

Results of the analyses demonstrate that fun was identified as a level A factors across the four activity categories. The factor of satisfaction was included

in three categories (individual unstructured, group unstructured, and individual structured) while energize and commitment appeared in one category each (individual unstructured and group structured) respectively.

Fun was the top ranked factor across all four categories. The identification of fun as a salient factor in physical activity selection is consistent with prior research in the youth enjoyment literature which has identified enjoyment as the most important factor in continued sport participation (Scanlan & Lewthwaite, 1986; Weirsma, 2001; Weiss & Williams, 2004). Although important, Bauman et al., (2002) identify "enjoyment of exercise" as a correlate of physical activity that is not fully explained by a theory or model, and called for more research in its importance. Within the older adult population, Henderson, Casper, Wilson, and Dern (2012) found that fun was an important element to participation, although this finding was mixed in with barriers to physical activity (health, support from family/friends) and was not fully explored. Present findings suggest that regardless of the setting in which an activity is undertaken (group/individual, structured/unstructured), the present group of healthy older adults characterize fun as the most important factor when selecting an activity. Knowing this, it may be reasonable to assume that activities that are not enjoyable will be selected less often by older adults. Therefore, if we are to increase physical activity participation in older adults through different types of programs, results suggest that making an activity fun is our best approach. Although previous research has identified the meaning of enjoyment in youth (see Weiss & Williams, 2004 for a review) future research should investigate the meaning of fun means in older

adults. This would provide the field with valuable information and has the potential to assist individuals interested in designing programs for the older adult population.

Satisfaction was the second most important factor and was identified in 3 of the four categories as a level A factor. This result indicates that the factor relating to the “feeling of having accomplished something worthwhile” is of great importance to older adults. Klusmann et al., (2012) allude to the importance of satisfaction when they discuss their view of aging research. The authors state that physical activity engagement leads to increased aging satisfaction which is ultimately a measure of a positive view of aging (Klusmann et al., 2012). Since their results did not address satisfaction as it pertains to importance in physical activity, but rather to the view of aging, our results add to the satisfaction and aging literature by identifying it as an important factor for initiating physical activity. Of course, each individual will have a different view of satisfaction in physical activity, but by recognizing its importance steps can be taken to integrate satisfaction into programs in ways that broadly promote this factor. This might be achieved by asking physical activity participants what they feel is a worthwhile accomplishment, and providing opportunities for individuals to achieve this. For example, a participant might feel that helping to improve the environment is worthwhile, so picking up garbage along a walk might provide satisfaction.

Commitment and energize were also found in level A for the categories of group structured and individual unstructured respectively. The definition for

commitment reads “having an obligation to attend physical activity each week because you told others you would”, which would lend itself to being important in a category that houses “traditional” group sports like curling, hockey, soccer, and baseball. This is consistent with the category of group structured activities since individuals that enroll in such activities may feel like other participants depend on them more readily. Additionally, this finding can be described within the commitment literature that defines commitment in a physical activity environment as a desire and resolve to continue participation (Scanlan, Carpenter, Schmidt, Simons, & Keeler, 1993). Consistent with the findings outlined above, Scanlan et al., (1993) indicate that the main contributor to commitment in physical activity is enjoyment. Taken together, it would appear that commitment and enjoyment are intimately related and partially explain why older adults participated in certain activities. It would be of interest to further investigate the links between fun and commitment. For example, these factors could be investigated in light of self-determination theory (Deci & Ryan, 1985) to determine if they relate to aspects of intrinsic and extrinsic motivation.

The factor energize was defined as "feeling invigorated by the activity" and is also closely associated with enjoyment literature. In a study by Fridlund Dunton, and Vaughan (2008), it was observed that participant's expected emotional outcomes could be correlated with the Transtheortical Model stages of change. For instance, they showed that expected positive feelings were greater for individuals in contemplation than pre-contemplation phase. As a result, positive feelings such as enjoyment or energized might have an effect on positive

feeling towards future success and help support continued physical activity. Finally, the Physical Activity Enjoyment Scale is commonly used to predict physical activity adherence by using dichotomous indicators. One item within the scale is "I find it energizing; I find it tiring" (Kendzierski & DeCarlo, 1991) which points to a link between fun and energize. Overall, results suggest that the factors associated with level A are related to each other and should be strongly considered when promoting physical activity in older adults.

Level B

Level B was the most populated level with an average of 11 (range: 9-13) factors falling within this level. There were four factors that were consistently reoccurring within all categories. Safety, learning, awareness, and productive were clearly important to older adults as influencers when considering physical activities. All four of these factors shared a commonality in that each were closely related to individual gain, and internal motivation. As mentioned previously, these are strong indicators of continued physical activity, and should be promoted within programs.

As mentioned, safety was a factor identified by many older adults for initiation of physical activities. This factor can be explained by Bronfenbrenner and Morris' (1998) bio-ecological model which suggests that a safe physical activity environment is critical for participation. For examples, if older adults live in an environment with varying climates (i.e., snow and ice during winter months), individuals may be less inclined to select an activity if they feel unsafe (i.e., falling on ice). These findings parallel results from the athlete development literature in

which individuals reported optimal development when they have safe and unlimited access to training opportunities (Carlson, 1988). Although not identified as the most important factor related to participation, this finding underscores the importance of making sure that precautions are put in place to ensure the physical safety of participants.

Learning was also a consistent factor in level B. Defined as “having an opportunity to advance knowledge while doing the activity”, these activities can be extrapolated to any activity that incorporate high levels of cognitive involvement or provide opportunities for learning during the activity. Informally, many participants commented that it was important for them to continue to learn as they age. This suggests that individuals will likely search out activities that will satisfy their desire to learn. These results are corroborated by Gretebeck et al. (2007) who found that individuals with a positive attitude towards an activity were more likely to participate. This suggests that older adults see learning as an inherent and desirable part of physical activity and value the opportunity to gain more knowledge, whether purposeful or incidental. It is possible that the concept of learning and attitude are inherently related as aspects of physical activity participation in older adults, however further research should investigate this claim. Based on current information, those wishing to offer physical activity programs might be well advised to enhance and promote the opportunity for learning for older adults.

Being productive was also identified across the four categories of level B. A recent study by Witcher, Holt, Spence, and O’Brien Cousins (2007) explored

physical activity participation in rural Newfoundland. A central theme that arose from their study was the need for physical activity to be seen as productive versus participating in the activity just “for the sake of health” (p.179). Additionally, it was found that in older adults associated leisure time activity as something that could be done only once all of the necessary work and chores were completed (Witcher et al., 2007). These types of attitudes were also identified in the current study as individuals indicated that being productive was of great importance to them.

The final factor that was identified in each of the four categories was awareness. A study by Price, Reed, Long, Maslow, and Hooker (2012) found that the type of environment in which an older adult participates affects their level of participation. While observing older adults on a walking trail, they found that most used the trail in spring, on sunny days, and in moderate weather. It was noted that these conditions provide the most pleasant experience and the best opportunity to enjoy the experience (Price et al., 2012). It is possible that the factor of awareness is akin to the findings reported by Price et al., (2012) however further research is needed to verify this claim and better understand how the concept of awareness fits within the physical activity participation rates of older adults.

Level C

The factor meaningful contribution was the only factor to be listed twice in level C and was also listed another two times in level B indicating its importance. Defined as "having an outcome that makes a difference to the betterment of a

community or group", this factor is closely related to the factor productive, but is focused on helping others, rather than oneself. Programs like Habitat for Humanity, and Women's Institute Roadside Clean Up are popular examples of how older adults can be physically active and helping their community. However, as with awareness, the factor of meaningful contributions has not specifically been linked to the physical activity domain and requires further research to better understand.

Overall, level C factors show mixture of intrinsic (satisfaction, learning, and competence) and extrinsic (safety, team, and competition) factors. This may indicate that both types of motivation are desirable, and if a planned correctly, might be appealing to individual who favour either intrinsic or extrinsic motivators (Deci & Ryan, 1985). However, it appears that intrinsically motivating factors are most important given that fun, satisfaction, and energize were identified as most important factors. It is well established that participation is most likely to occur when activities are intrinsically motivating (Deci & Ryan, 1985) suggesting that a focus may be placed on these types factors. As mentioned above, it would be worthwhile to investigate the role of different types of motivation in relation to these factors.

Other factors

Beyond levels a, b, and c, factors existed in each category that were not identified as being important. These factors were either not recorded on the data record sheet by the participants, or their confidence intervals crossed zero and therefore, were not included. The only factor that appeared in all four categories

was interaction in depth. This suggests that in depth conversation during physical activity is of little importance in any physical activity setting. The rest of the factors varied, with some being in 2 or three categories, and others only being found in one. It is important to note which factors of least importance within categories, to ensure that time and resources are not being allocated to elements of physical activity that are not seen as important to the population. Instead, the focus should be on those factors that are clearly very important to this population, such as fun and satisfaction.

Limitations and future directions

Although the results of this study help us understand the role of additional factors in activity selection and non-selection in older adults, a number of limitations exist. First, it was noted that mean line lengths did not match with the ranking (or non-ranking) of factors. If a factor was ranked the number one most important factor for a category the corresponding line length was often not the longest of all identified factors. This may be explained by the fact that many participants seemed to find the line scoring monotonous after the initial time, and scored each line much more quickly with each subsequent category. This incongruence between the line lengths and the FoR scores suggests that individual put more thought into ranking the factors within the group as a whole, rather than rating each one individually. With the context provided by other factors, participants seemed much more engaged and focused on ranking their top five factors. Future research might take this into consideration when asking

participants about importance with multiple options.

Another limitation is whether or not this is an exhaustive list of factors. Although participants were encouraged to suggest additional factors, it is possible that not all factors are listed or defined. For instance, much literature, including commitment in physical activity literature (Scanlan, et al., 1993) indicates that the social aspect of physical activity is very important. The Committee indicated that social should be broken down into interaction in depth and interaction casual, instead of one overarching factor of social. It is possible that the words used to define "social" were not clearly understood by participants, and therefore, that essence of the factor was missed. However, it may also indicate that the social component is not as important as previously thought (Stiggelbout et al., 2008). In addition, the participants that constituted the Committee and the discussion groups were from one small region of Canada and may not represent the full demographics of Canadian older adults. There was little ethnic diversity and cultural backgrounds, which could mean the results of this research may not be generalizable to other groups, both in Canada and abroad. Further research is warranted to determine if these factors hold true in a variety of different cultural and demographic settings.

This area of study would benefit from further research with a larger sample size of more diverse individuals (i.e., even representation of sex, socio-economic status, education). Finally, it would be of interest to include various ethnic groups, as this study used primarily Caucasian, English speaking Canadians.

Conclusion

Ultimately, the data show which factors are most important to older adults when selecting physical activity and attempts to answer Bandura's (2004) call for identification of "other factors". This research provides practical information that is easily understood and implemented into a variety of physical activity settings. There is also a strong indication that the context in which an activity occurs should be considered. This information is useful to organizations, families, and individuals who wish to create physical activities opportunities for older adults. Based on this information, it is possible that incorporating these factors could help increase participation rates within this population. This may help address the inactivity levels in older adults, and could consequently help improve overall health. Older adults can take this information to modify their current physical activities or use it to guide future decisions. Finally, these results can be used to guide further exploration and analysis into the factors that lead to physical activity selection in older adults.

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List of Appendices

Appendix A

UPEI UNIVERSITY of Prince Edward ISLAND

January 29th, 2013

Hello,

my name is Katie Beck and I am a Master's student at the University of Prince Edward Island. I am conducting research on physical activity and aging and am looking for volunteer participants for the month of March. This is an excellent opportunity to help make a difference for Island seniors.

I am looking for 6-8 older adults per group, between the ages of 65 and 75 years from a wide variety of educational, physical activity, socioeconomic, ethnic, and rural/urban backgrounds. In addition, you are encouraged to bring a friend, family member or spouse/significant other who fit within this age category as well.

Interested parties are needed to participate in a one-time meeting to discuss characteristics of physical activity that affect participation. The discussion group will last about 1-1.5 hours. It can be arranged that this meeting will take place before or after your monthly meeting of this senior's group and at your usual meeting place, or nearby, as to reduce the amount of driving needed.

All information discussed will remain confidential within the group and any information collected will be strictly confidential within the research setting. Your name will not be used when reporting the data.

If you are interested in participating or learning more, please contact me as soon as possible.

Thank you, and I look forward to hearing from you,

Katie Beck
University of Prince Edward Island
Email: kbeck@upei.ca
Toll free: 1-855-738-4792 (leave a message with your contact information)

Appendix B

UPEI UNIVERSITY of Prince Edward ISLAND

LETTER OF INFORMATION

Characteristics of Older Adult's Physical Activities

The information below describes a research study and invites you to volunteer to participate in the research being conducted. Approximately 15 adults between the ages of 65-75 years of age from varying educational, ethnic, socioeconomic and rural/urban locations are needed.

The purpose of the present study is to gather information from older adults to help identify possible characteristics of physical activity that may influence selection or non-selection of activities.

The researchers for this study are Katie Beck (Graduate Student, University of Prince Edward Island) and Dr. Dany MacDonald (University of Prince Edward Island). Participation in this research project requires participants to sit on the Physical Activity and Aging Research Committee (PAARC). This will require a time commitment of approximately 10 hours and will take place at the University of Prince Edward Island. PAARC members will be an integral part of the research design of the second phase of the study. The role of the committee is to work with the researcher to create a study that is meaningful to the community. You will be asked to identify "flex factors" and "sub flex factors" of physical activity. Flex factors are defined as characteristics that are identified as favourable in physical activities and will change depending on the individual. This will be done by writing down your own flex factors and having a discussion with other participants about what factors matter to this age group. The session will be video-recorded and your written answers will be collected. An electronic or paper summary of the discussions will then be given to participants for approval. Permission to video record and use direct quotations is requested. Pseudonyms of participants in all oral and written reports of this research will be used to protect identity. All data will be kept in locked location and only accessed by the research team. As a reminder your participation in this study is completely voluntary and you can decide to stop participating at any point without consequence. You will be required to sign a consent form to participate. Signing this form also signifies that you will not divulge names of people attending or information discussed within the meetings.

All the information collected will remain confidential to Katie Beck and Dr. Dany MacDonald. Throughout the entire study, all information will be kept in a locked filing cabinet.

There are no physical, psychological, economic or social risks associated to participation in this study.

If you have any comments or questions regarding to this research project, please contact the UPEI Research Ethics Board at 902-620-5104 or by e-mail at lmacdonald@upei.ca. Alternatively, you can contact us using the information provided below:

Katie Beck
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Department of Applied Human Sciences
University of Prince Edward Island
Email: danymacdonald@upei.ca
Phone: 902-566-6482

UPEI UNIVERSITY of Prince Edward ISLAND

LETTER OF INFORMATION

Characteristics of Older Adult's Physical Activities

The information below describes a research study and invites you to volunteer to participate in the research being conducted. Approximately 40 adults between the ages of 65-75 years of age from varying educational, ethnic, socioeconomic and rural/urban locations are needed.

The purpose of the present study is to gather information from older adults to help identify possible characteristics of physical activity that may influence selection or non-selection of activities.

The researchers for this study are Katie Beck (Graduate Student, University of Prince Edward Island) and Dr. Dany MacDonald (University of Prince Edward Island). Participation in this research project requires participants to be part of a one-time focus group discussion. This will require a time commitment of approximately 1 - 1.5 hours and will take place at a location within your community. The role of the focus group is to work with the researcher to answer questions regarding physical activity preferences. You will be asked to identify "flex factors" and "sub flex factors" of physical activity. Flex factors are defined as characteristics that are identified as favourable in physical activities and will change depending on the individual. This will be done by writing down your own flex factors and having a discussion with other participants about what factors matter to this age group. The session will be video and audio recorded and your written answers will be collected. An electronic or paper summary of the discussions will then be given to participants for approval. Permission to video and audio record and use direct quotations is requested. Pseudonyms of participants in all oral and written reports of this research will be used to protect identity. All data will be kept in locked location and only accessed by the research team. As a reminder your participation in this study is completely voluntary and you can decide to stop participating at any point without consequence. You will be required to sign a consent form to participate. Signing this form also signifies that you will not divulge names of people attending or information discussed within the meetings.

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Appendix C

UPEI UNIVERSITY of Prince Edward ISLAND

PARTICIPANT CONSENT FORM

Characteristics of Older Adult's Physical Activities

I have read the letter of information and understand the purpose of the present research study. I have been given the opportunity to ask any questions or discuss the project with the researcher(s) and my questions/concerns have been answered to my satisfaction. I hereby consent to take part in the present study. I confirm that I am an adult between the ages of 65-75 years old. I understand that the role I am undertaking is as a member of the Physical Activity and Aging Research Committee (PAARC) and will be asked to discuss issues surrounding characteristics of physical activity. I will be an integral part of the research team and will help shape the research design of the next phase of the study and can expect to commit 10 hours of my time to the project. I also understand that all of the information collected will remain confidential to the research team, Dany MacDonald and Katie Beck. I agree that I will not divulge the names of people in attendance or the information discussed at the PAARC meetings. I give permission to be video recorded and to the use of direct quotations. I understand pseudonyms will be used to protect identity in external communications and ensure anonymity. I also understand that information will be kept confidential within the limits of the law. If I am unable to attend a meeting, I will inform the researcher at the earliest possible time. I understand that I can keep a copy of the signed and dated consent form. Finally, I realize that participation in this research is voluntary and I can withdraw from this study at any moment or chose to not answer any question posed without consequences.

I consent to participate in this research project.

Participant Name	**Signature**	**Date**

Name of researcher	**Signature**	**Date**

If you wish to receive a summary of the results, please check the box below and provide your contact information.

☐ Yes, I would like to receive a summary of the results

Send at the following address: _____

_____

_____

Or e-mail address: _____

If you have any comments or questions regarding to this research project, please contact the UPEI Research Ethics Board at 902-620-5104 or by e-mail at lmacdonald@upei.ca. Alternatively, you can contact us using the information provided below:

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UPEI UNIVERSITY of Prince Edward ISLAND

PARTICIPANT CONSENT FORM

Characteristics of Older Adult's Physical Activities

I have read the letter of information and understand the purpose of the present research study. I have been given the opportunity to ask any questions or discuss the project with the researcher(s) and my questions/concerns have been answered to my satisfaction. I hereby consent to take part in the present study. I confirm that I am an adult between the ages of 65-75 years old. I understand that the role I am undertaking is as a participant in a focus group and will be asked to discuss issues surrounding characteristics of physical activity. I will be an integral part of the research team and can expect to commit 1- 1.5 hours of my time to the project. I also understand that all of the information collected will remain confidential to the research team, Dany MacDonald and Katie Beck. I agree that I will not divulge the names of people in attendance or the information discussed at the focus group meetings. I give permission to be video and audio recorded and to the use of direct quotations. I understand pseudonyms will be used to protect identity in external communications and ensure anonymity. I also understand that information will be kept confidential within the limits of the law. If I am unable to attend a meeting, I will inform the researcher at the earliest possible time. I understand that I can keep a copy of the signed and dated consent form. Finally, I realize that participation in this research is voluntary and I can withdraw from this study at any moment or chose to not answer any question posed without consequences.

I consent to participate in this research project.

Participant Name	**Signature**	**Date**

Name of researcher	**Signature**	**Date**

If you wish to receive a summary of the results, please check the box below and provide your contact information.

☐ Yes, I would like to receive a summary of the results

Send at the following address: _____

_____

_____

Or e-mail address: _____

If you have any comments or questions regarding to this research project, please contact the UPEI Research Ethics Board at 902-620-5104 or by e-mail at lmacdonald@upei.ca. Alternatively, you can contact us using the information provided below:

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University of Prince Edward Island
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Appendix D

General Demographics and Physical Activity Questionnaire

Please answer the questions to the best of your ability and elaborate where necessary.

1. Birth date: _____Day _____Month _____Year

2. Are you:
____ female
____ male

3. What is your current marital status?
____ married or common-law
____ widowed
____ divorced/separated
____ never married

4. What is your highest level of education?
____ grade 8 or less
____ some high school
____ high school diploma
____ trade school or college diploma
____ university degree
____ PhD
____ other (please specify)_____

5. What is your living situation?
____ I live alone
____ I live with one other person
____ I live with two other people
____ I live with more than two other people

6. Would you classify yourself as living in:
____ a rural location (country or small community)
____ an urban location (city or large community)

7. Which ethnic or cultural group(s) do you identify with? E.g. Canadian, French, Acadien, Chinese, Mi'kmaq, Lebanese, Dutch, Japanese, etc.
_____

8. Do you presently do any paid work?
____ no
____ I work part-time
____ I work full-time

9. How does your income compare to a typical Island family?
____ higher

_____ about the same
_____ lower

10. At the current time, how well does your income satisfy your family's needs?
_____ very well
_____ adequately
_____ with some difficulty
_____ not very well
_____ totally inadequate

10. Approximately, what is your household's total income per year, before taxes?
_____ under $15,000
_____ $15,000 - $24,999
_____ $25,000 - $34,999
_____ $35,000 - $49,999
_____ $50,000 - $74,999
_____ more than $75,000

11. How would you rate your overall health at the present time?
_____ very poor
_____ poor
_____ fair
_____ good
_____ excellent

12. Do you have:
_____ heart disease
_____ type II diabetes
_____ high blood pressure
_____ physical limitations (anything that limits your ability to move around. E.g. knee/hip replacements)
_____ arthritis
_____ any other medical conditions that might affect physical activity participation? (please specify)

_____

13. Please indicate your past level of physical activity (through occupation or recreation):
_____ I have never been physically active
_____ I was active in early adulthood (approx until age 25) but not now
_____ I was active in middle adulthood (approx until age 50) but not now
_____ I have recently taken up physical activity (within last 10-15 years)
_____ I have been active my whole life and continue to be active now

Appendix E

Group Unstructured (1)

Participant: _____

Question: Using the scale below, how important is each factor when you are considering a physical activity to participate in? Please write in the factor names we've decided go in this category and then tick off on the line how important it is to you.

Factor Name:

Least Important **Most Important**

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

Individual Unstructured (2)

Participant: _____

Question: Using the scale below, how important is each factor when you are considering a physical activity to participate in? Please write in the factor names we've decided go in this category and then tick off on the line how important it is to you.

Factor Name:

Least Important **Most Important**

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

Individual Structured (3)

Participant: _____

Question: Using the scale below, how important is each factor when you are considering a physical activity to participate in? Please write in the factor names we've decided go in this category and then tick off on the line how important it is to you.

Factor Name:

Least Important **Most Important**

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

Group Structured (4)

Participant: _____

Question: Using the scale below, how important is each factor when you are considering a physical activity to participate in? Please write in the factor names we've decided go in this category and then tick off on the line how important it is to you.

Factor Name:

Least Important **Most Important**

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

Appendix F

Counter-balance schedule

1- Group Unstructured 2- Individual Unstructured 3- Individual Structured 4- Group Structured

2- Individual Unstructured 3- Individual Structured 4- Group Structured 1- Group Unstructured

3- Individual Structured 4- Group Structured 1- Group Unstructured 2- Individual Unstructured

4- Group Structured 1- Group Unstructured 2- Individual Unstructured 3- Individual Structured

2- Individual Unstructured 1- Group Unstructured 3- Individual Structured 4- Group Structured

3- Individual Structured 2- Individual Unstructured 1- Group Unstructured 4- Group Structured

4- Group Structured 3- Individual Structured 2- Individual Unstructured 1- Group Unstructured

1- Group Unstructured 3- Individual Structured 4- Group Structured 2- Individual Unstructured